

CLAIMS

1. A material, comprising:

5 a diamond-like carbon film formed on a surface of a base material; and
 a polymer grafted to a surface of the diamond-like carbon film.

2. A medical material comprising a biocompatible component chemically bonded to a surface of a diamond-like carbon film formed on a surface of a base material.

10 3. The medical material of claim 2, wherein the biocompatible component is a polymer introduced by graft polymerization to the surface of the diamond-like carbon film.

15 4. The medical material of claim 3, wherein the biocompatible component is a polymer formed by grafting vinylmonomers which contain fluorine to the surface of the diamond-like carbon film.

5. The medical material of claim 3, wherein the biocompatible component is a molecule containing silicon, the molecule being grafted to the surface of the diamond-like carbon film.

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6. The medical material of claim 2, wherein the biocompatible component is bonded by a covalent bond to the surface of the diamond-like carbon film.

25 7. The medical material of claim 2, wherein the biocompatible component is bonded by an ionic bond to the surface of the diamond-like carbon film.

8. The medical material of claim 2, wherein the biocompatible component contains at least one functional group selected from a group consisting of an ethylene oxide group, a hydroxy group, a phosphate group, an amino group, an amido group, a phosphorylcholine group, a sulfone group, and a carboxyl group.

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9. The medical material of claim 2, wherein an intermediate layer is provided between the base material and the diamond-like carbon film to improve adhesion between the base material and the diamond-like carbon film.

10 10. The medical material of claim 9, wherein the intermediate layer is an amorphous film containing silicon and carbon as primary constituents.

11. A medical material, comprising a hydrophilic functional group introduced to a surface of a diamond-like carbon film formed on a surface of a base material.

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12. The medical material of any one of claims 2-11, wherein the base material is a metal material, ceramic material, or macromolecular material, or a complex thereof.

13. A medical instrument formed by using the medical material of any one of claims 2-11.

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14. The medical instrument of claim 13, wherein the medical instrument is a medical instrument which is to be embedded in a living body.

15. The medical instrument of claim 14, wherein the medical instrument is a catheter, 25 guide wire, stent, artificial cardiovalvular membrane, or artificial joint.

16. A material surface treating method, comprising:

a diamond-like carbon film formation step of forming a diamond-like carbon film on a surface of a base material;

5 an activation step of generating on a surface of the diamond-like carbon film a reactive region which serves as a polymerization starting point; and

a polymerization step of polymerizing monomers using the polymerization starting point to graft the monomers to the surface of the diamond-like carbon film.

17. The method of claim 16 further comprising, before the diamond-like carbon film

10 formation step, an intermediate layer formation step of forming on the surface of the base material an intermediate layer for improving adhesion between the base material and the diamond-like carbon film.

18. The method of claim 17 wherein, in the intermediate layer formation step, the

15 intermediate layer is formed of an amorphous film containing silicon and carbon as primary constituents.

19. The method of claim 16, wherein the activation step is the step of generating a free radical as the polymerization starting point.

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20. The method of claim 16, wherein the activation step is a plasma irradiation step of irradiating the surface of the diamond-like carbon film with plasma.

21. The method of claim 20, wherein the plasma irradiation step uses, as the plasma,

25 argon, xenon, neon, helium, krypton, nitrogen, oxygen, ammonium, hydrogen, or water vapor.

22. The method of claims 16-21, wherein:

the base material is a base material for a medical material; and
the polymer is a biocompatible component.

5 23. A material surface treating method, comprising:

a diamond-like carbon film formation step of forming a diamond-like carbon film
on a surface of a base material;

a plasma irradiation step of irradiating a surface of the diamond-like carbon film
with plasma to generate a reactive region on the surface of the diamond-like carbon film;

10 and

a surface modification step of causing a reaction of the reactive region and a
molecule containing oxygen to introduce a hydroxy group to the surface of the
diamond-like carbon film.